

FORM-PTO-1390
(Rev. 12-29-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

032221-008

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

Unassigned

09/719229

INTERNATIONAL APPLICATION NO.
PCT/FI99/00569INTERNATIONAL FILING DATE
28 June 1999PRIORITY DATE CLAIMED
9 July 1998

TITLE OF INVENTION

A CHIP SCREENING METHOD AND PLANT

APPLICANT(S) FOR DO/EO/US

Hannu TÄHKÄNEN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

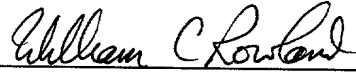
1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
- ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

PCT INTERNATIONAL SEARCH REPORT
PCT INTERNATIONAL PRELIMINARY EXAMINATION REPORT
PCT REQUEST
PCT DEMAND CHAPTER II

09/71/229

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.50) Unassigned		INTERNATIONAL APPLICATION NO. PCT/FI99/00569		ATTORNEY'S DOCKET NUMBER 032221-008	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1,000.00 (960) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 (970) International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 (958) International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 (956) International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 (962)					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$ 1000.00	
Surcharge of \$130.00 (154) for furnishing the oath or declaration later than 20 <input type="checkbox"/> 30 <input type="checkbox"/> months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	6 -20 =	0	X\$18.00 (966)	\$	
Independent Claims	2 -3 =	0	X\$80.00 (964)	\$	
Multiple dependent claim(s) (if applicable)			+ \$270.00 (968)	\$	
TOTAL OF ABOVE CALCULATIONS =				\$ 1000.00	
Reduction for 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$ 1000.00	
Processing fee of \$130.00 (156) for furnishing the English translation later than 20 <input type="checkbox"/> 30 <input type="checkbox"/> months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 1000.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 (581) per property +				\$	
TOTAL FEES ENCLOSED =				\$ 1000.00	
				Amount to be:	
				refunded	\$
				charged	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ 1000.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 02-4800 in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: Ronald L. Grudziecki BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, Virginia 22313-1404 (703) 836-6620					
 SIGNATURE					
William C. Rowland NAME					
December 11, 2000					
30,888 REGISTRATION NUMBER					

Patent
Attorney's Docket No. 032221-008

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of)
Hannu TÄHKÄNEN) Group Art Unit: Unassigned
Application No.: Unassigned) Examiner: Unassigned
Filed: December 11, 2000)
For: A CHIP SCREENING METHOD)
AND PLANT)
)
)
)
)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified patent application, please
amend the application, please amend the application as follows:

IN THE CLAIMS:

Please amend claim 5 as follows:

Claim 5, line 1, change " any one of claims 1 to 4" to --claim 1--.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: December 11, 2000

6/PRTS

A CHIP SCREENING METHOD AND PLANT

This invention relates to the screening of wood chips and, especially, to the removal of the pin chips and to the dosing of them back into the process.

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The objective of the chip screening is to free the chips from such shares of small-size and large-size fractions that could have a detrimental effect on the pulp making process. In the screening process, the large-size fractions (too big and too thick chips) are usually treated by means of a rechipper, for example, into smaller particles or crushed by means of a roller press into a form more suitable for the process. The finest fraction (the sawdust) causes problems in most processes, which is why every effort is made to purify the chips from it as well as possible. The next biggest fraction, the so-called pin chips, as such, constitutes quite a good raw material in terms of fibres, but a high content of pin chips is disadvantageous to some processes, e.g. to continuously operating digesters, as it may cause malfunctions in the process (e.g. blocks).

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For the removal of pin chips, the same kind of devices are used as for the removal of sawdust, i.e. flat screens, vibrating screens, roll screens, disc screens and so forth. To the screening elements themselves, however, changes are made because of the larger particle size. Screening plants known in the prior art are described, for example, in Finnish patent specifications 79251 and 90019. If the subsequent process (a chemical or a mechanical pulp making process) sets strict restrictions on the maximal amount of pin chips, and if it is possible that the pin content of the material to be fed is high, the pin chips are usually separated by screening and stored in a separate bin. Then, the pin chips are dosed into the accepted fraction fed to the subsequent process, using a constant ratio. The plants designed for this purpose are reliable as such but represent, from an economical point of view, a considerable extra investment.

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The characteristics of the method and the plant according to the present invention are set forth in claims 1 and 6.

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On an average, the amount of pin chips among the chips to be screened is usually larger than the allowable amount, especially when the chips are bought from sawmills. The method according to the invention provides the same result at substantially lower costs. The pin chips are separated in the screening process but a maximum desired amount is
 5 dosed back among the chips due for the process immediately after the separation. Thus, no intermediate storage of the pin chips, and, consequently, no pin bin with auxiliary devices are needed in the method according to the invention. The screening can be optimised.

The invention and the details thereof will now be described in more detail with reference to
 10 the following drawings wherein

figure 1 shows the traditional way of separating and dosing pin chips using a flat screen, figure 2 shows a method of separating and dosing pin chips in connection with thickness screening,

15 figure 3 shows the method of separating and dosing pin chips according to the invention using a flat screen,

figure 4 shows the method of separating and dosing pin chips according to the invention in connection with thickness screening,

figure 5 shows the principles of the pin chip dosing method according to the invention in
 20 connection with a sectional feeder,

figure 6 shows a dosing screw and

figure 7 shows the use of a scraper conveyor for the dosing.

Figure 1 shows a screening system for separating pin chips and for re-dosing them so that
 25 the amount of pin chips among the chips that are to be led to the subsequent process remains constant. A flat screen 1 divides the input 2 into four parts. The large-size fraction 3 is led to a rechipper from which, once the re-chipping has been completed, it is conducted back to screen 1 via an air separating cyclone 5. The accepted fraction 6 is led to the subsequent process 7. The finest material 8, i.e. the sawdust, is usually led to a burning
 30 process. The pin chips 9 are conducted into a pin bin 10 from which a pin chip flow 11 of desired size is dosed back into the subsequent process 7. When the pin bin 10 becomes full, the pins are discharged from the bin among the sawdust 12, for example, to be burned.

In figure 2 is shown a thickness screening system wherein the large-size fraction 3, i.e. the chips that have crossed the first thickness screen 13, is led to a roller press 14. The chips 15 treated by the roller press are led directly to the subsequent process 7. The chips 16 that have penetrated the end part of the thickness screen are led directly to the subsequent process. The chips 17 that have penetrated the front part fall onto a sawdust screen 18. The particles 8 that have penetrated the sawdust screen are sawdust and are led to a burning process. The chips that have crossed the sawdust screen are pin chips 9 that are led into a pin bin and treated in the same way as in figure 1.

Figure 3 shows the pin chip dosing method according to the invention in connection with a flat screen. The pin chips 9 are led from the screen directly to a dosing apparatus 19 that doses only a certain amount 20 of pin chips into the subsequent process. The dosing apparatus 19 leads the surplus 21 of the pin chips among the sawdust 8. Alternatively, the surplus 21 of the pin chips is transported away from the screening plant, back to the chip pile, for example (if the variation in chip quality is only temporary), or, to a separate sawdust digesting process, for which the relevant pin fraction is excellent.

In figure 4, the pin chip dosing method according to the invention is used in a thickness screening system. Pin chips 9 coming from a sawdust screen 18 are led to a dosing apparatus 19' which, in this case, is constituted by two screw conveyors. The dosing apparatus 19' operates in the same way as the dosing apparatus shown in figure 3.

Said dosing can be performed by means of many kinds of devices that feed only a certain amount of pin chips among the accepted chips at a certain rate. The rest of the pin chips are led among the sawdust or away from the screening process, as desired. It is essential that the dosing apparatus is set for dosing the appropriate chip amount. Some of the most common ways of performing this kind of dosing are described in the following. In a so-called sectional feeder, for example, the pin chips are led into the feeding chute 22 of the sectional feeder 19 (figure 5). The dosing apparatus can be set to dose a desired amount 20 of pins into the subsequent process by adjusting the size of the sections 23 and the rate of

rotation of the rotor 24. The rest 21 of the pin chips fall over the lower edge 25 of the feeding chute 22.

Correspondingly, dosing can be performed for example by means of two screw conveyors (figure 6). A desired amount of pin chips 20 is extracted by means of adjusting the speed of rotation of the lower screw conveyor 26. The upper screw conveyor 27 transports the rest 21 of the pin chips to a separate discharge opening 30 from which they are conducted , for example, among the sawdust. Dosing can be also performed by means of a scraper conveyor (figure 7), for example by adjusting the rate of speed of the lower scraper conveyor 28 to control the amount of pin chips 20 led into the subsequent process. It is also possible to place a screw conveyor under the scraper conveyor 29, to operate according to figure 6.

If the input of the screening process varies in quantity, the input or the output of the screening process can be measured and, correspondingly, the amount of pin chips led to the subsequent process can be adjusted. Thus, the ratio of the pin chips to the total amount of chips led to the subsequent process remains constant all the time. If the input of screening plant is constant, a constant amount of pin chips can be dosed.

The term "pin chip" is defined, for example, in standard SCAN-CM 40:94.

Claims

1. A wood chip screening method wherein the pin chips (9) are separated from the rest of the chips and dosed among chips that are to be led to a subsequent process (7) so that the share of the pin chips (9) relative to the total amount of chips (7) does not exceed a desired value, **characterised** in that a desired amount (20) of the pin chips separated in the screening process, once the screening process has been completed, is led among the chips that are to be led to the subsequent process (7) without intermediate storage.
2. A chip screening method as defined in claim 1, **characterised** in that the amount of pin chips (20) led among the chips that are to be led to the subsequent process (7) is defined by means of a dosing apparatus (19, 19', 26, 28).
3. A chip screening method as defined in claim 1, **characterised** in that the amount of pin chips (20) led among the chips that are to be led to the subsequent process (7) is defined by measuring the amount of chips (2) fed into the screening process.
4. A chip screening method as defined in claim 1, **characterised** in that the amount of pin chips (20) dosed among the chips that are to be led to the subsequent process is defined by measuring the amount of chips fed into the subsequent process (7) from the screening process.
5. A chip screening method as defined in any one of claims 1 to 4, **characterised** in that the amount of pin chips (21) exceeding the desired amount (20) is led among the sawdust or to the chip pile preceding the screening process or to a separate pin pile.
6. A plant for screening wood chips and for leading them to a subsequent process (7), which plant comprises one or more screening devices (1, 18) and means for dosing the pin chips (9) among chips (7) that are to be led to the subsequent process, **characterised** in that the means (19, 19', 26, 28) for dosing the pin chips (9) among the chips (7) that are to be led to the subsequent process are placed immediately after the screening devices (1, 18) or the conveyors (27, 29) coming therefrom.

Abstract

A chip screening method and plant wherein the pin chips (9) are separated from the rest of the chips and dosed among chips that are to be led to a subsequent process (7) so that the share of the pin chips (9) relative to the total amount of chips (7) does not exceed a desired value. After the screening process, a desired amount of pin chips (20) is dosed among the chips that are to be led to a subsequent process (7) without intermediate storage.

(Fig. 3)

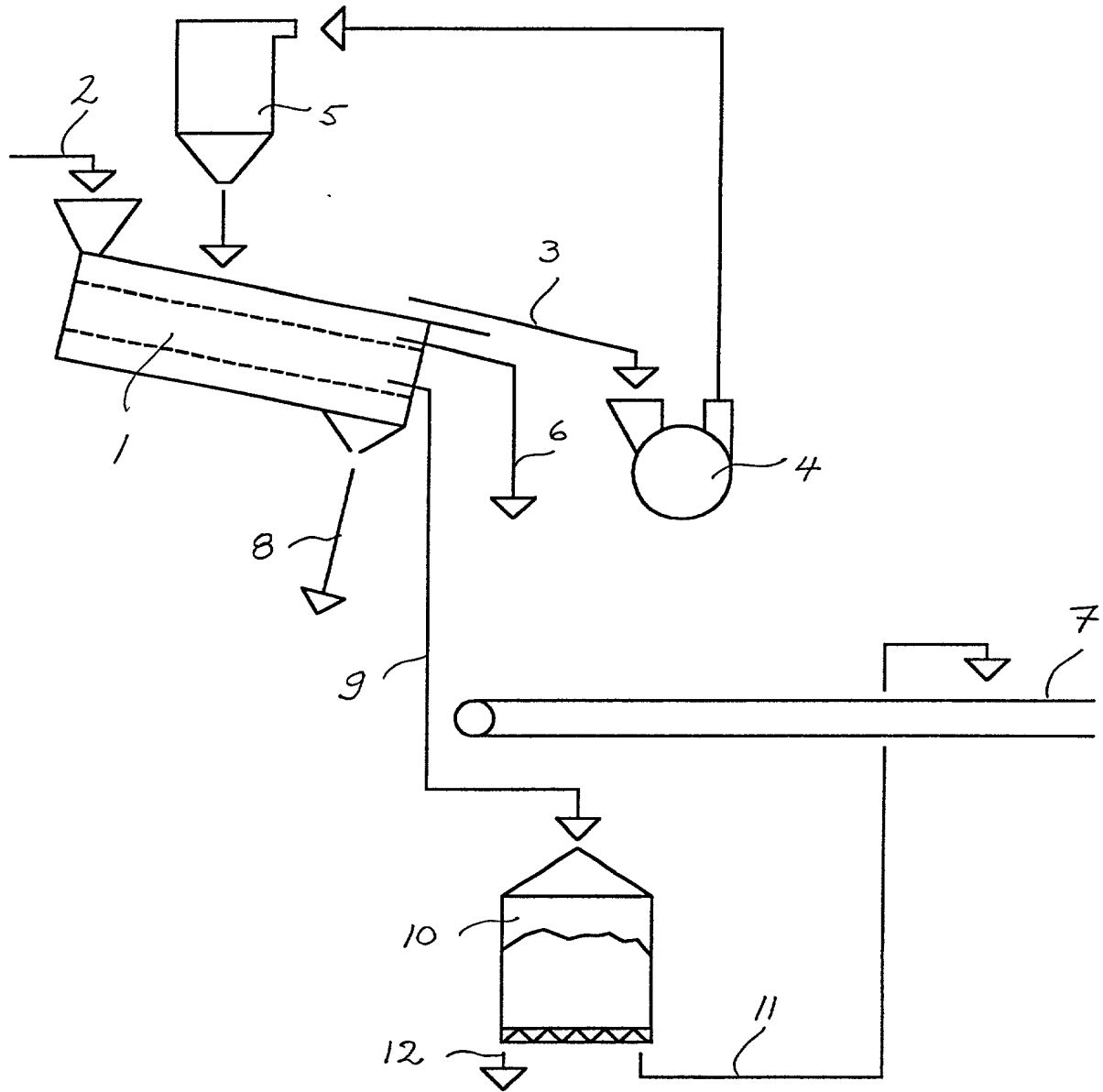


Fig. 1

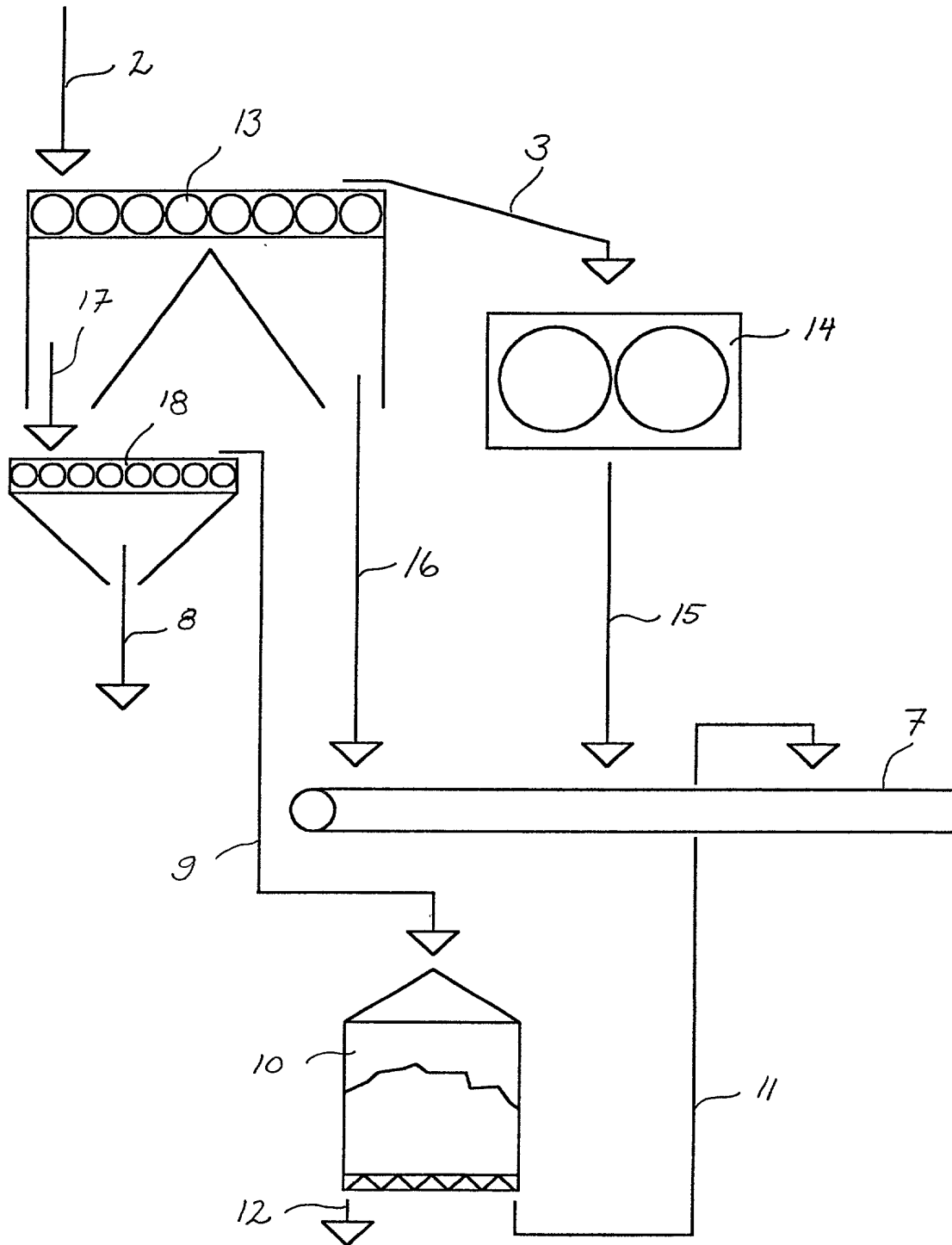


Fig. 2

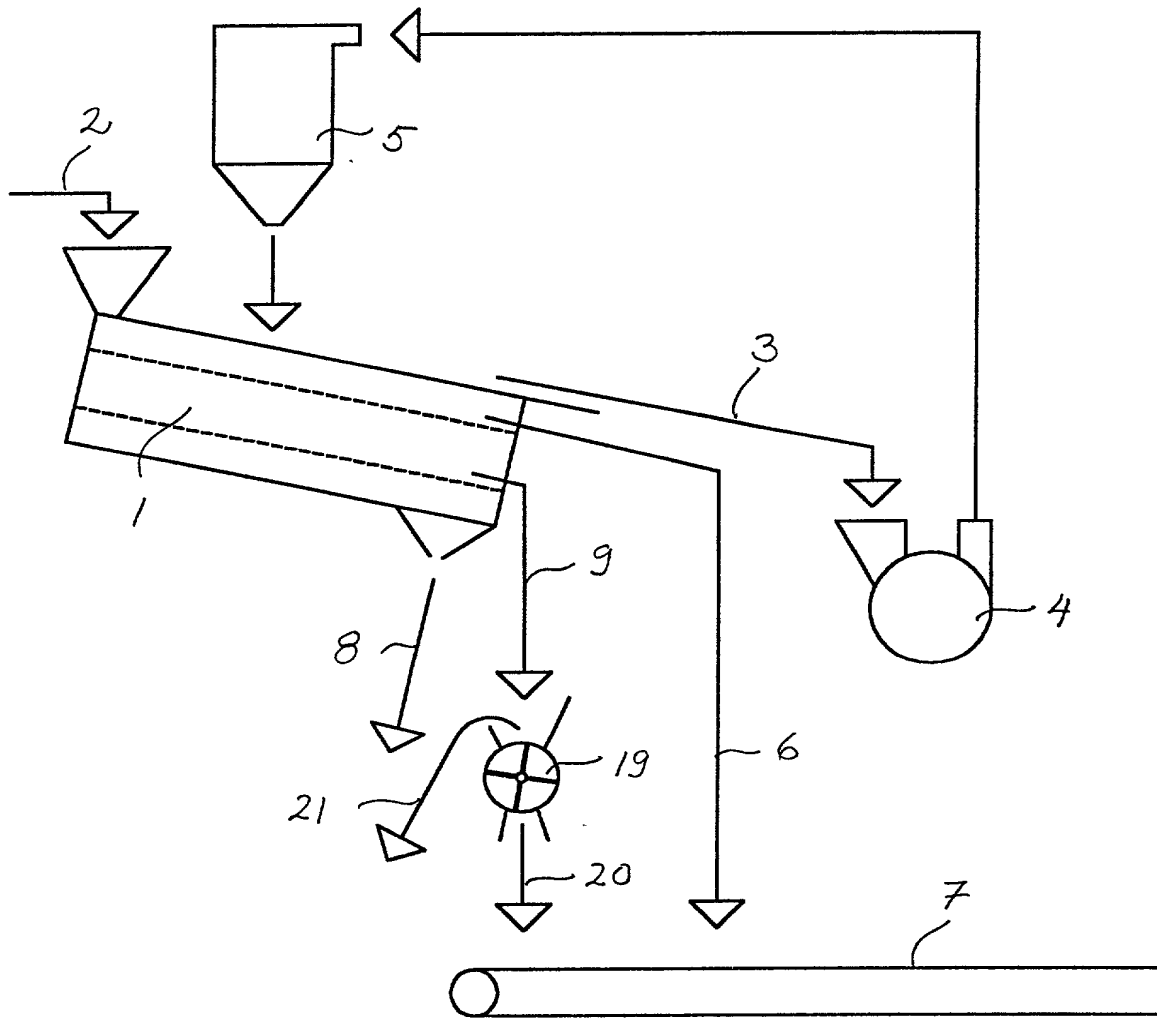


Fig. 3

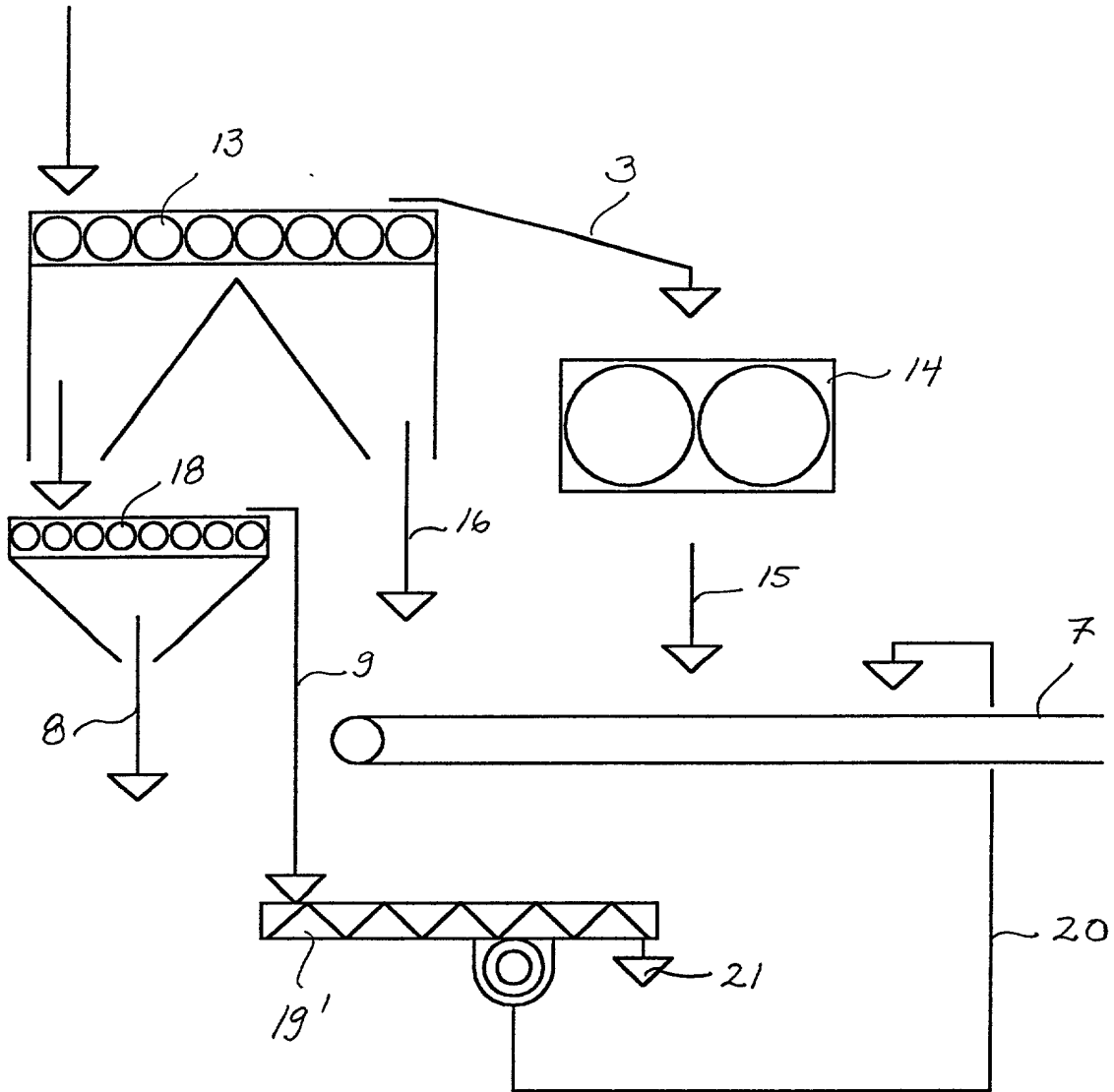
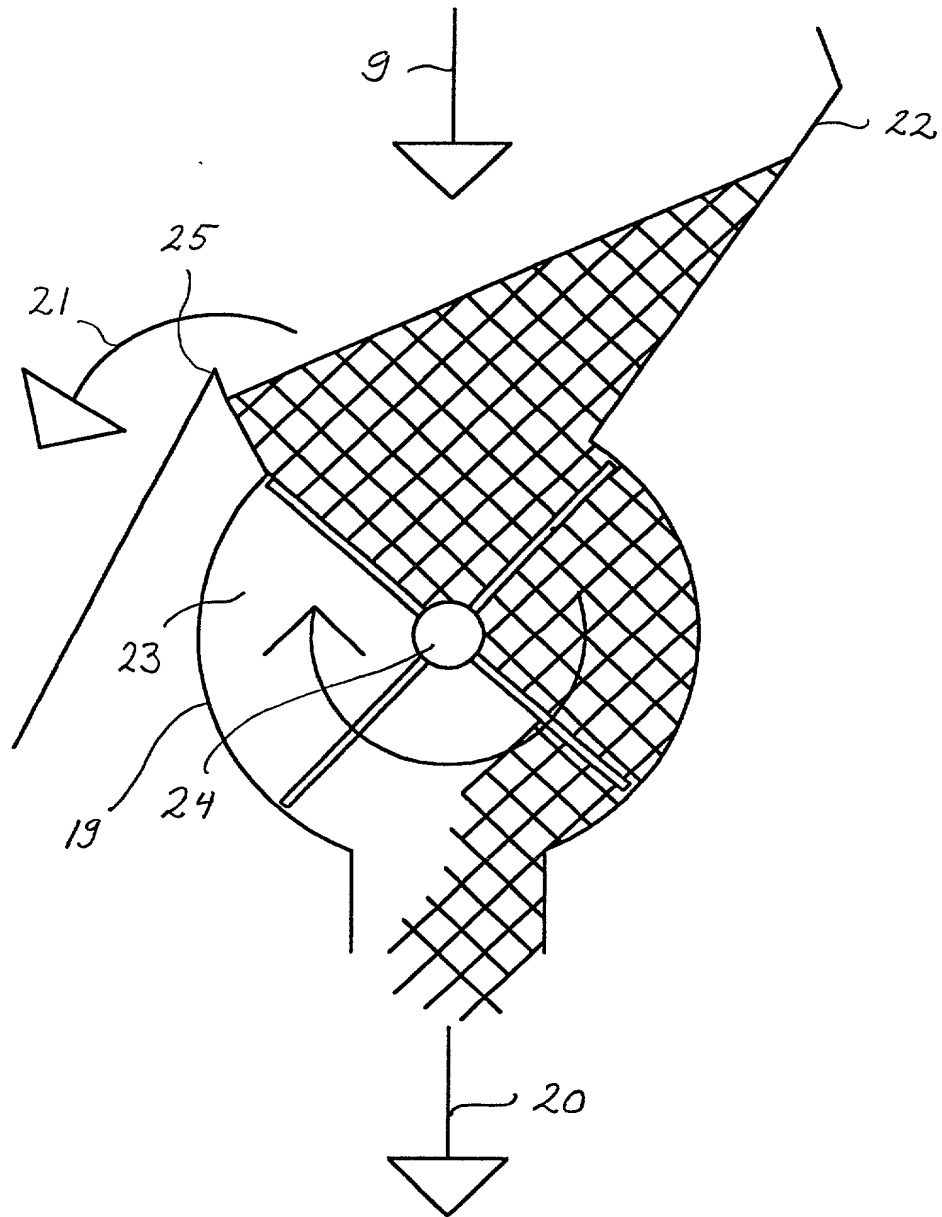


Fig. 4



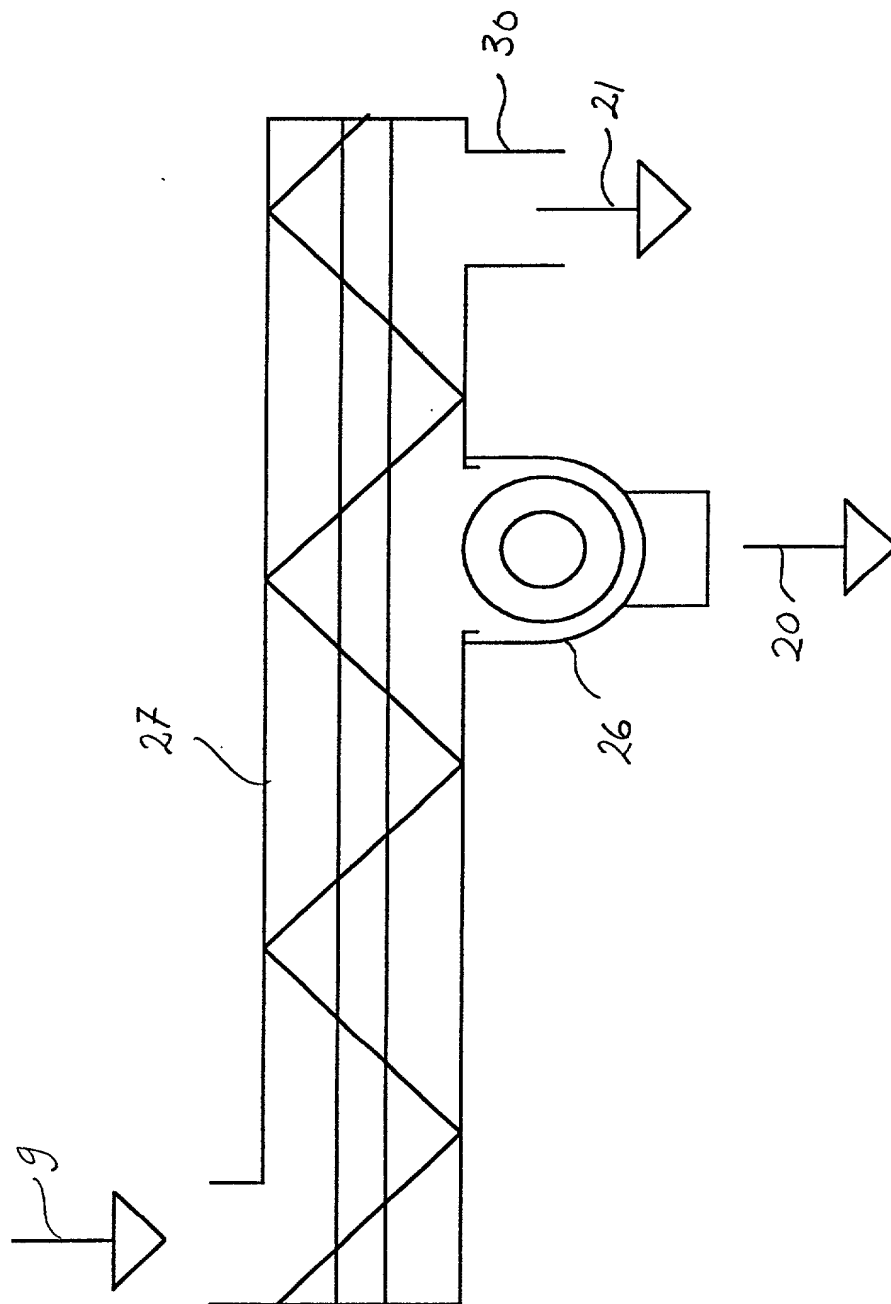


Fig. 6

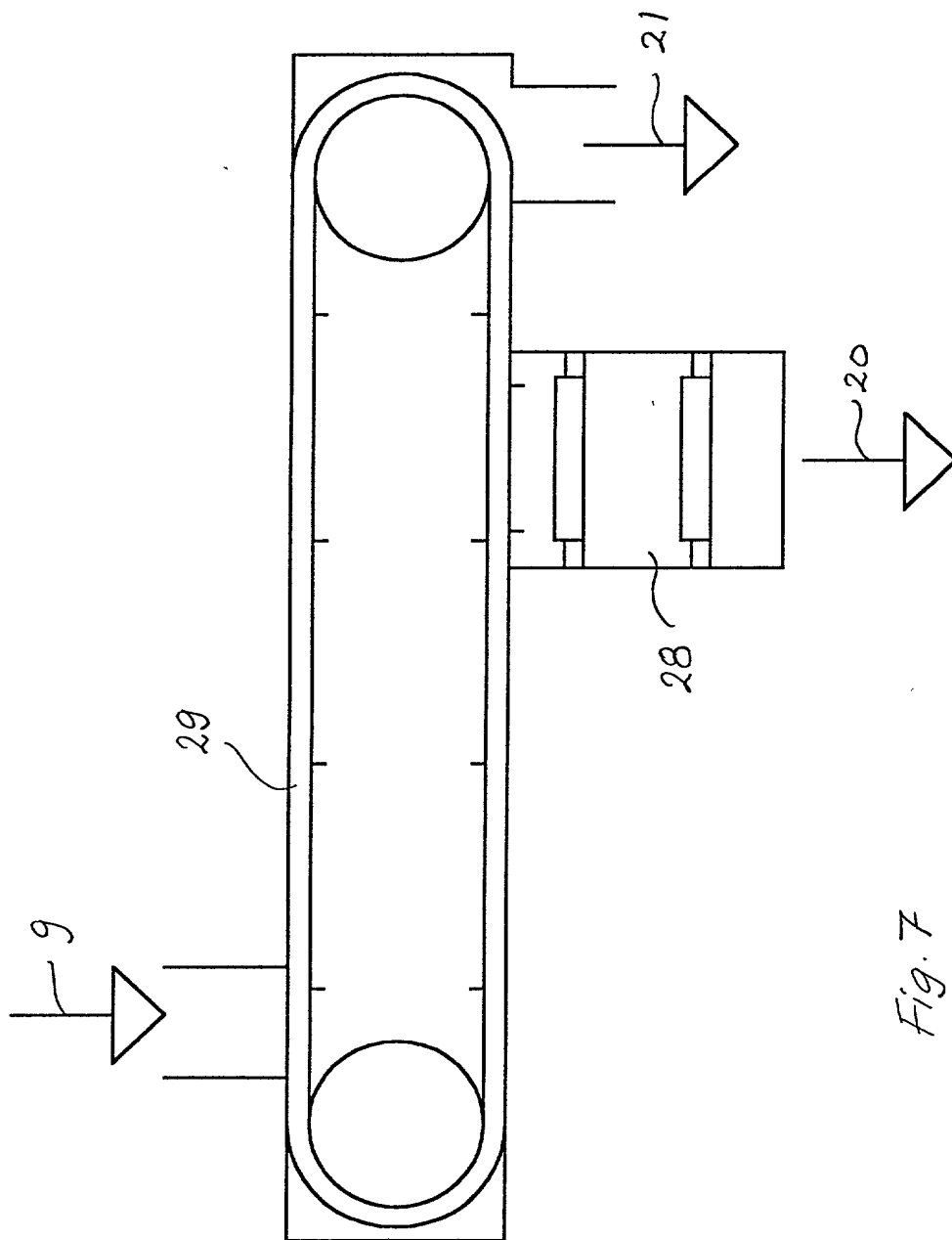


Fig. 7

#4

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
 (Includes Reference to Provisional and PCT International Applications)

Attorney's Docket No.

032221-008

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

A CHIP SCREENING METHOD AND PLANT

the specification of which (check only one item below):

☐ is attached hereto.

☒ was filed as United States application

Number 09/719,229

on December 11, 2000

and was amended

on _____ (if applicable).

☐ was filed as PCT international application

Number _____

on _____

and was amended

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
Finland	981578	9 July 1998	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PCT	PCT/FI99/00569	28 June 1999	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

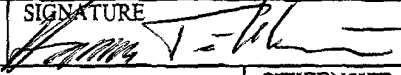
(Application Number)

(Filing Date)

(Application Number)

(Filing Date)

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONT'D) (Includes Reference to Provisional and PCT International Applications)	Attorney's Docket No. 032221-008
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FULL NAME OF SOLE OR FIRST INVENTOR Hannu TÄHKÄNEN	SIGNATURE 	DATE Jan. 25, 2001
RESIDENCE Florence, Alabama, U.S.A. AL	CITIZENSHIP Finland	
POST OFFICE ADDRESS 3102 C Kendall Drive, Florence, Alabama 35630, U.S.A.		

F06020" 6263 F 660